

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(562) 799-9469 Fax (562) 799-9459

December 11, 1997

Project Number 5936-96

Boeing Realty Company
4060 Lakewood Boulevard
Lakewood, California 90808

Attn: Mr. Johnny Marasco

**RE: Observation and Testing of Backfill Operations from
Demolition Procedures for Phase I - Located at the Southwest
Corner of 190th Street and Normandie Avenue, in the City of Los
Angeles, California**

Dear Mr. Marasco:

Pursuant to your request, this firm has observed and tested backfill operations from demolition procedures at the above referenced project. The results of compaction tests are attached and locations of these tests are shown on the accompanying plans. All work was performed in accordance with all present day standards of the Geotechnical Engineering Industry.

Backfill Operations

Several areas including environmental piping trenches were demolished of existing structures and lines and then backfilled with compacted fill soils. Some subsurface structures consisting of concrete slabs and caissons were left in place in some areas. Any structure left in place was demolished to a minimum of 4 feet below ground surface. Items left in place are shown on the attached plans by Tait & Associates along with the elevation at which the structure lies. Other items of note are:

- The large northerly Excavation A was backfilled to -1 foot of existing grades.
- Pits 2, 4 and Building 36 excavation were also filled to within 1 foot of existing grades.
- Excavation 13 was tested only at 3.0-3.5 feet below existing surrounding grades.
- Maximum depth of fill placed in environmental trenches was 3 feet.
- Abandonment in-place of caissons and slabs was performed with the approval of City of Los Angeles Grading Department officials. ✓

The maximum depth of fill placed during backfill operations was approximately 12 feet. Fill soils were compacted to a minimum of 90% of the laboratory standard in lifts not in excess of eight inches in thickness. Rubber tire and track-mounted grading equipment was used for compaction control; a water truck provided moisture control. The approximate limits of compacted fill are shown on the attached plans.

Laboratory/Field Testing

The relative compaction was determined by Sand Cone Method (ASTM: D1556-82) and by the Drive Tube Method (ASTM: D2937). The maximum density of the fill soils was obtained by the laboratory standard (ASTM: D1557-82) and results are shown on Table I. Tests were performed a minimum of every 500 cubic yards placed and every two feet in depth of fill placed. Results of field density tests are presented in Table II. No chemical analysis was performed by NorCal Engineering on the tank excavation nor the backfill soils.

Conclusions

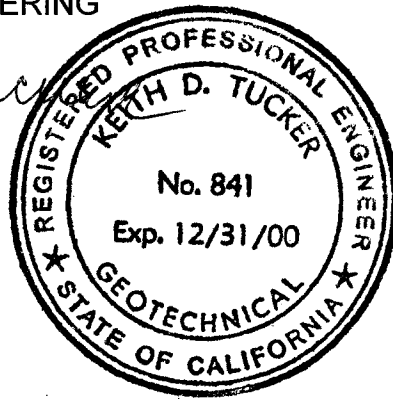
The geotechnical engineering aspects of the backfill operations have been observed and are in compliance with the geotechnical engineer's recommendations. Additional subsurface investigation and laboratory testing will be necessary in fill areas which will support new structures. The backfill meets secondary fill requirements for support of pavement and floor slab.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker

Keith D. Tucker
Project Engineer
R.G.E. 841



Mark Burkholder

Mark Burkholder
Project Manager

NorCal Engineering

TABLE I
MAXIMUM DENSITY TESTS
(ASTM: D1557-78)

<u>Sample</u>	<u>Classification</u>	<u>Optimum Moisture</u>	<u>Maximum Dry Density (lbs./cu.ft.)</u>
I	Silty clay	14.0	110.0
II	Silty clay	13.0	112.0
III	Clayey silt	12.0	121.0
IV	SAND, fine to medium grained, silt with slight clay with gravel	10.0	128.0
V	Crushed Miscellaneous Base	7.5	138.0
VI	Silty clay	12.0	120.0
VII	Silty clay with gravel and brick	13.5	130.0
VIII	Clayey silt with gravel	12.5	125.0

TABLE II
COMPACTION TEST RESULTS

<u>Date of Test</u>	<u>Test No.</u>	<u>*Depth</u>	<u>Percent Moisture</u>	<u>Unit Wt. lbs./cu.ft.</u>	<u>Relative Compaction</u>	<u>Soil Type</u>
5/21/97	101	8.0-8.5	18.5	102.9	93	I
5/21/97	102	8.0-8.5	13.9	108.8	98	I
5/21/97	103	6.0-6.5	13.4	118.2	97	III
5/21/97	104	6.0-6.5	10.2	114.3	94	III
5/21/97	105	6.0-6.5	14.0	120.2	99	III
5/22/97	106	5.0-5.5	9.8	119.3	98	III
5/22/97	107	5.0-5.5	13.0	116.1	95	III
5/22/97	108	5.0-5.5	13.3	114.7	95	III
5/22/97	109	5.0-5.5	13.6	112.7	93	III
5/22/97	110	4.0-4.5	14.4	116.3	96	III
5/22/97	111	4.0-4.5	16.3	116.9	96	III
5/22/97	112	4.0-4.5	15.4	116.1	95	III
5/22/97	113	4.0-4.5	11.3	118.0	97	III
5/22/97	114	3.0-3.5	13.2	115.9	95	III
5/23/97	115	3.0-3.5	12.2	118.5	97	III
5/23/97	116	3.0-3.5	12.8	118.8	97	III

*Depth below finish grade (in feet)

**Retest of failing tests after area reworked

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COMPACTION TEST RESULTS

<u>Date of Test</u>	<u>Test No.</u>	<u>*Depth</u>	<u>Percent Moisture</u>	<u>Unit Wt. lbs./cu.ft.</u>	<u>Relative Compaction</u>	<u>Soil Type</u>
5/23/97	117	3.0-3.5	13.4	120.8	99	III
5/23/97	118	3.0-3.5	13.1	115.8	95	III
5/27/97	119	2.0-2.5	13.4	118.2	97	III
5/27/97	120	2.0-2.5	13.1	114.9	94	III
5/28/97	121	3.0-3.5	13.8	118.6	98	III
5/28/97	122	2.0-2.5	12.1	111.5	92	III
5/29/97	123	4.0-4.5	13.7	117.9	97	III
5/30/97	124	3.0-3.5	12.6	119.4	98	III
5/30/97	125	1.0-1.5	13.2	113.1	93	III
5/30/97	126	1.0-1.5	12.9	116.9	96	III
5/30/97	127	1.0-1.5	13.0	115.0	95	III
5/30/97	128	1.0-1.5	13.0	115.9	96	III
5/30/97	129	3.0-3.5	14.0	114.9	94	III
6/25/97	130	3.0-3.5	15.5	115.0	95	III
6/25/97	131	3.0-3.5	14.2	115.5	95	III
6/25/97	132	3.0-3.5	11.0	113.5	93	III

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COMPACTION TEST RESULTS

<u>Date of Test</u>	<u>Test No.</u>	<u>*Depth</u>	<u>Percent Moisture</u>	<u>Unit Wt. lbs./cu.ft.</u>	<u>Relative Compaction</u>	<u>Soil Type</u>
6/27/97	133	3.0-3.5	10.2	114.3	94	III
6/27/97	134	1.0-1.5	13.5	121.3	95	IV
6/27/97	135	0.0-0.5	11.1	124.8	97	IV
6/27/97	136	1.0-1.5	12.3	117.8	92	IV
6/27/97	137	0.0-0.5	12.1	121.3	95	IV
6/30/97	138	0.0-0.5	11.0	112.6	93	III
6/30/97	139	1.0-1.5	14.0	113.1	93	III
6/30/97	140	1.0-1.5	11.4	115.2	95	III
6/30/97	141	0.0-0.5	12.1	111.5	92	III
6/30/97	142	0.0-0.5	10.2	109.8	90	III
7/31/97	143	Test not a part of current backfill operations				
8/1/97	144	Test not a part of current backfill operations				
8/1/97	145	Test not a part of current backfill operations				
9/17/97	146	10.0-10.5	14.1	113.1	94	VI
9/17/97	147	12.0-12.5	13.5	111.0	93	VI
9/17/97	148	7.5-8.0	12.2	111.4	93	VI

*Depth below finish grade (in feet)

**Retest of failing tests after area reworked

TABLE II

NorCal Engineering

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9/18/97	149	8.0-8.5	13.8	117.9	91	VII
9/18/97	150	11.0-11.5	12.7	115.3	92	VIII
9/18/97	151	10.0-10.5	13.8	116.9	90	VII
9/19/97	152	9.0-9.5	12.9	114.1	91	VIII
9/19/97	153	7.5-8.0	13.1	116.4	93	VIII
9/19/97	154	8.0-8.5	14.2	119.4	92	VII
9/22/97	155	6.0-6.5	11.1	116.7	90	VII
9/22/97	156	5.0-5.5	10.8	117.1	90	VII
9/22/97	157	5.5-6.0	8.6	118.8	91	VII
9/23/97	158	4.0-4.5	11.2	120.5	93	VII
9/23/97	159	3.0-3.5	8.9	120.3	93	VII
9/23/97	160	3.5-4.0	12.6	117.3	90	VII
9/23/97	161	4.5-5.0	12.8	115.2	92	VIII
9/24/97	162	3.0-3.0	9.6	118.6	91	VII
9/24/97	163	3.5-4.0	12.5	118.8	91	VII
9/24/97	164	2.5-3.0	12.9	116.5	93	VIII

*Depth below finish grade (in feet)

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CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
ENGINEER'S CERTIFICATE OF COMPLIANCE FOR COMPACTED EARTH FILLS

JOB/LEGAL ADDRESS: Southwest Corner of 190th St. & Normamdie Ave.

SOIL TESTING AGENCY: NorCal Engineering

PROPERTY OWNER'S: NAME: Boeing Realty Company

OWNER'S ADDRESS: 4060 Lakewood Blvd., Lakewood

PER REPORTS ON OUR PROJECT NUMBER: 5936-96


DATE OF WORK STARTED ON PROJECT: 5/21/97

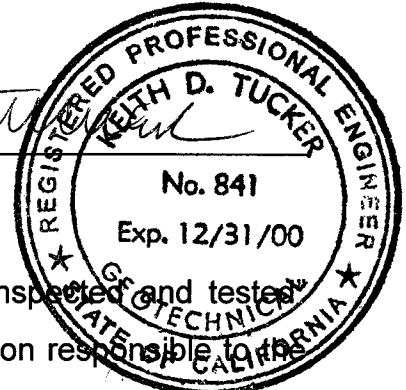
DATE FILL WAS COMPLETED: 11/10/97

DATE OF THIS CERTIFICATE: 2/5/98

TO THE SUPERINTENDENT OF BUILDING:

I hereby certify that I have personally inspected and tested the placing of compacted earth fill on the above described property, and on the basis of these inspections and tests it is my opinion that the same was placed in conformity with the requirements of the Los Angeles City Building Code.


Keith D. Tucker
R.G.E. 841



*For the purpose of this certificate, to have "personally inspected and tested" shall include inspection and testing performed by any person responsible to the licensed engineer signing this certificate. Where the inspection and testing of all or part of the work above is delegated, full responsibility shall be assumed by the licensed engineer whose signature is affixed thereon.

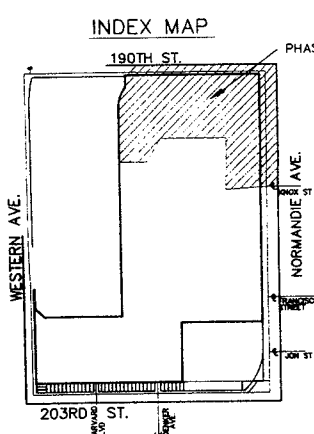
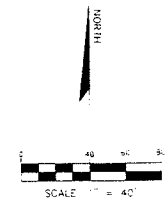
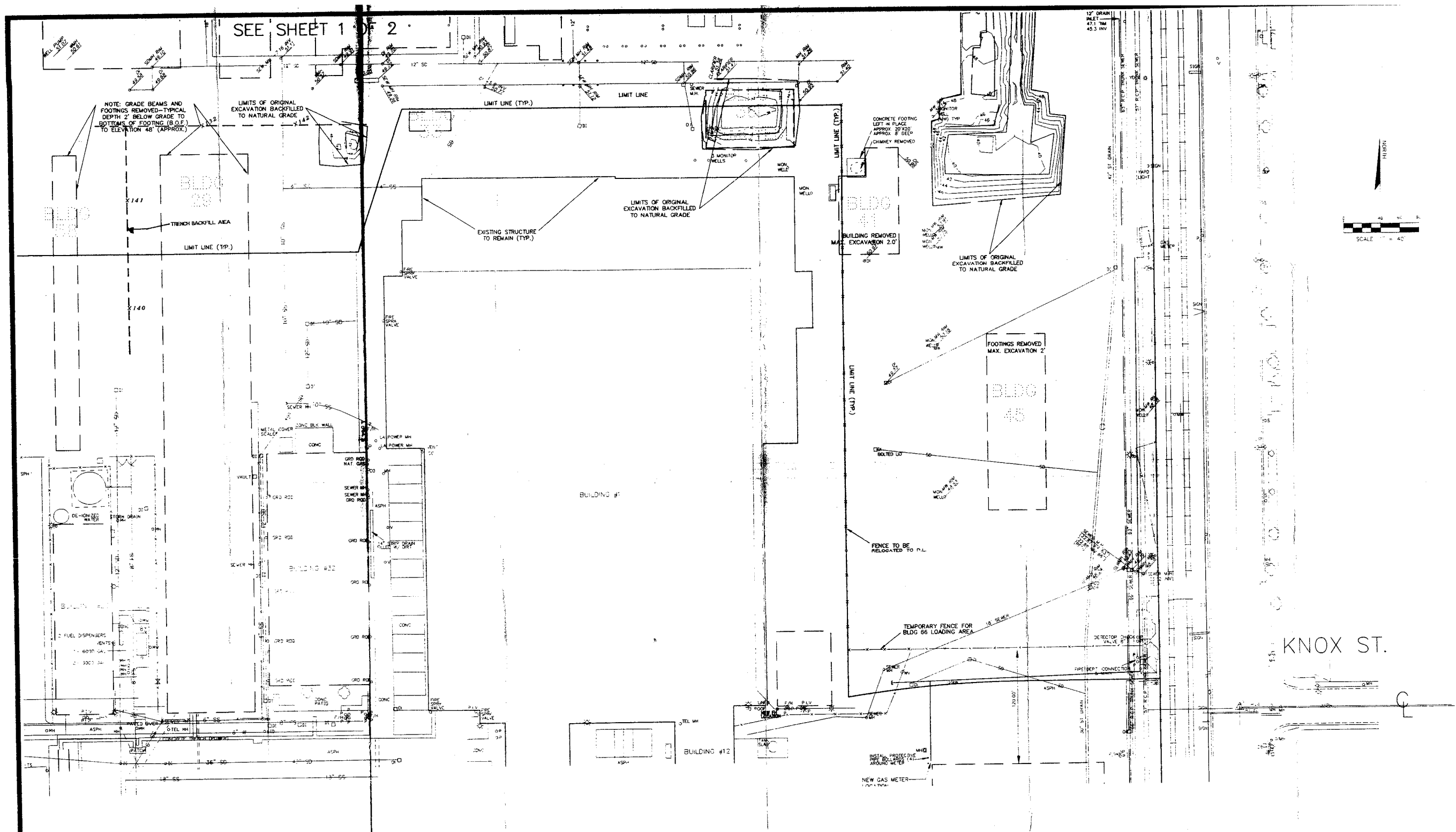
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<u>Date of Test</u>	<u>Test No.</u>	<u>*Depth</u>	<u>Percent Moisture</u>	<u>Unit Wt. lbs./cu.ft.</u>	<u>Relative Compaction</u>	<u>Soil Type</u>
9/24/97	165	2.0-2.5	12.3	115.3	92	VIII
9/24/97	166	1.5-2.0	11.8	116.5	93	VIII
9/25/97	167	2.0-2.5	10.5	123.1	95	VII
9/25/97	168	1.0-1.5	11.4	114.8	92	VIII
9/25/97	169	1.0-1.5	11.2	120.5	93	VII
9/29/97	170	1.5-2.0	13.8	120.4	93	VII
9/29/97	171	0.0-0.5	12.4	117.4	90	VII
9/29/97	172	0.0-0.5	10.7	117.5	90	VII
9/29/97	173	0.0-0.5	13.6	120.1	92	VII
11/5/97	174	12.0-12.5	14.6	106.5	95	II
11/5/97	175	10.0-10.5	13.2	117.4	94	VIII
11/5/97	176	9.0-9.5	12.9	119.6	92	VII
11/5/97	177	8.0-8.5	13.8	116.9	93	VIII
11/6/97	178	6.0-6.5	11.5	121.1	97	VIII
11/6/97	179	4.5-5.0	14.1	113.0	93	VIII
11/7/97	180	3.0-3.5	12.4	116.5	96	VIII
11/10/97	181	1.0-1.5	10.9	119.0	95	VIII

*Depth below finish grade (in feet)

**Retest of failing tests after area reworked

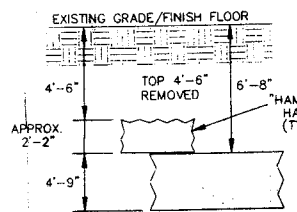
NorCal Engineering



IMPORTANT NOTICE
Set in 4219/4217 of the Government
The requires a Dig Alert notification
Number 38 issued before a
permit to excavate will be valid
for your Dig Alert ID Number 38

UNDERGROUND SERVICE ALERT
1-800-422-4133
For underground location
Working Days before the Dig

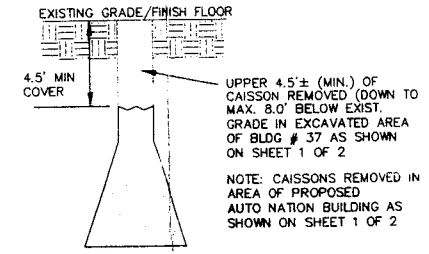
Engineers Note to Contractor:
The existence and location of any underground utilities, pipes,
and/or structures shown on these plans were obtained by a search
of available records. To the best of our knowledge, there are no
existing utilities except as shown on these plans. The contractor
shall ascertain the true vertical and horizontal location of
those underground utilities to be used and shall be responsible
for any damage to any public or private utilities, shown or not
shown herein.



PIT DETAIL
N.T.S.

CAISSON DETAIL
N.T.S.

TYPICAL FOUNDATIONS REMAINING



NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS
BOEING REALTY
PROJECT 5008-08 DATE DEC. 1997

LOCATION OF COMPACTION TESTS

LEGEND

---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	AC	ASPH. CONCRETE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	BP	BLOW FLOW PREVENTOR
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CB	CABLE TELEVISION
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CL	CATCH BASIN
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	CURB FACE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	CHAIN LINK FENCE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	CLEAN OUT
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	DRAIN INLET
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	DRAIN MAIN HOLE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	ELECTRICAL METER
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	FIRE DEPT. CONNECTION
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	FIRE HYDRANT
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	GAS METER
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	GUARD POST
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	IRRIGATION CONTROL VALVE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	POST BOX
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	POST INDICATOR VALVE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	POWER HOLE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	SEW. STORM DRAIN
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	STREET LIGHT PULL BOX
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	SEWER MAN HOLE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	SANITARY SEWER
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	FORCED MAIN
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	STREET LIGHT
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	TELEPHONE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	TRAFFIC SIGNAL PULL BOX
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	UNDERGROUND
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	WATER METER
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	WATER VALVE
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	YARD LIGHT
---	EXISTING CAISSON IN PLACE AT MAX. 2' ± BELOW EXIST. GRADE	CP	WALL

AS-BUILT DEMOLITION PLAN
MCDONNELL DOUGLAS REALTY CO.
4000 LAKELAND BLVD., SUITE 100
HARBOR GATEWAY
LOS ANGELES, CA

TITLE
PROJECT

DRAWN BY
10/21/97

CHECKED
DATE

REVISION # 1
DATE

DATE
10/21/97

PROJECT
10/21/97



1100 TOWN & COUNTRY ROAD
SUITE 1200
P.O. Box 4429
Orange, California 92668
(714) 560-8200
(714) 560-8211 FAX

TAIT & ASSOCIATES INC.